

## NEW ORLEANS FORECAST DISTRICT

Three general cold waves occurred—on the 7th–8th, 15th–16th, and December 30–January 1. They were preceded by crescent-shaped troughs of low pressure with the southern end of the trough swinging eastward more rapidly than the northern end, resulting in cold waves of wide sweep, with rapid movement over the extreme southern sections.

No cold wave occurred without timely warning, and the cold-wave warnings issued were verified except that the required minimum temperatures were not reached at El Paso and Brownsville, Tex., on the 8th. Southeastern Louisiana was excepted in the warnings for the cold wave of the 15th–16th and no cold wave occurred in that portion of the State in this instance. Warning for Oklahoma was issued on the morning of the 10th for a cold wave of limited extent, which occurred in that State the following night.

Livestock interests were given the cold-wave warnings, and livestock and special warnings were also issued on the morning of the 17th for the northern portion of the district for low temperatures that occurred the following morning.

Frost or temperature warnings for the more southern sections were issued on the 1st, 2d, 3d, 4th, 8th, 9th, 16th, 17th, 18th, 19th, and 20th. The warning of the 8th advised the cutting of sugar cane, and temperatures of 23° to 26° occurred in the sugar region of Louisiana the next morning.

The cold waves were attended by northerly winds, requiring either small-craft or storm warnings. Northwest storm warnings for the Texas coast and small-craft warnings for the Louisiana coast were issued on the morning of the 7th; northwest storm warnings for the Texas coast and small-craft warnings for Morgan City, La., on the morning of the 15th, with small-craft warnings for the remainder of the Louisiana coast at 12:20 p. m. of the 15th; and northwest storm warnings for the coast from Morgan City, La., to Brownsville, Tex., at 8 p. m. of the 30th, with extension along the remainder of the Louisiana coast the next morning. Small-craft warnings were issued also by local officials as follows: At Galveston, Tex., in the afternoon of the 6th, and at Corpus Christi, Tex., in the afternoons of the 8th, 14th, 17th, and 30th. No storm occurred without warning.

"Norther" warnings for shipping at Tampico, Mexico, were issued on the 7th, 15th, 18th, and 30th, and strong northerly winds or gales occurred as indicated.—*R. A. Dyke.*

## DENVER FORECAST DISTRICT

Mean temperatures were considerably below normal throughout the district, especially in the northern and central portions. In Montana the deficiencies ranged from 11° to 19° and at several stations in that State this was the coldest December experienced in more than 40 years. The mean temperature of 1.2° at Havre was the lowest for December since the record began, in 1880. In general, precipitation was above normal, although a few stations reported deficiencies.

The month was characterized by a succession of high-pressure areas over Montana and the Canadian territory to the northward. The most noteworthy of these HIGHS appeared north of Montana on the 27th, attained marked intensity by the morning of the 30th, and had overspread the entire Rocky Mountain and Great

Plains regions by the morning of the 31st. A crest reading of 31.22 inches at Miles City was reached the evening of the 31st. Most of these northern HIGHS were skirted by troughlike low-pressure systems extending from British Columbia southeastward to Colorado and thence eastward or northeastward across the Missouri Valley.

Numerous centers of low pressure moved more or less rapidly along this path, resulting in radical temperature changes in Montana, Wyoming, and Colorado, and necessitating the issuing of many cold-wave warnings as follows: On the 5th, 6th, 7th, 9th, 12th, 13th, 14th, 15th, 16th, 27th, 28th, 29th, and 30th.

Most of these warnings were fully verified; the rest were partially verified. On one or two occasions the cold waves overspread some territory not included in the warnings. Warnings of frosts and freezing temperatures for south central and southeastern Arizona were issued frequently throughout the month; most of them were successful. Warnings of fresh to strong winds, for the benefit of aviators, and, when snow and low temperatures were expected also, for the benefit of stockmen, were issued as follows: On the 3d, 4th, 5th, 6th, 11th, 14th, 15th, 16th, 17th, and 19th.—*E. B. Gittings.*

## SAN FRANCISCO FORECAST DISTRICT

A high-pressure system which moved inland early in the month developed sufficient strength, concurrently with a moderate depression over and to the west of Baja California, to bring about "Santa Ana" winds in southern California on the 4th and create a fire hazard of unusual acuteness for the winter season. Several brush and timber fires occurred in the Los Angeles area. These winds were definitely indicated in the district forecast of December 3.

On the 6th a southward movement of Arctic high pressure brought unseasonably cold weather to the Plateau and intermountain regions, advance warning of which was given. A second very marked period of cold over the same region was ushered in on the 14th, sub-zero temperatures being recorded in eastern Washington. Temperatures below normal were forecast, but cold-wave warnings were not issued. A third period of very unusual cold and the most extreme of all began on the 28th. It covered more territory than the others, extending west of the Cascade Mountains and persisting into the opening days of the next month. Its advent was plainly indicated on the weather charts, and advance notice was given.

Storm or small-craft warnings were displayed on nine occasions on the north coast and twice on the California coast above San Francisco. Two of these warnings were apparently uncalled for. A third, which was followed by only fresh winds at shore stations, may have been justified by the occurrence of moderate gales at sea.

Special snow warnings were sent to recipients in western Washington on the 31st and well verified. The regular route forecasts for air-mail lines were issued as usual, especial importance attending them due to the prevalence of inclement weather. The pilot on the Fresno-Los Angeles route met with disaster on December 25. He was prevented by rain and wind from landing at Bakersfield on his way south, and, turning back in the hope of finding better conditions at his starting point, was overtaken by darkness and forced to come down by parachute, leaving his plane to crash.—*T. R. Reed.*